Forest Health Protection
Pacific Southwest Region

Date: July 10, 2019
File Code: 3400

To: Scott Russell, Forest Supervisor, Shasta-Trinity National Forest

Subject: Eastside Restoration Project

At the request of Craig Sewell, a site visit was made to the Eastside Restoration Project, Shasta-Trinity National Forest, on June 25, 2019. The objectives were to assess the current insect and disease conditions.

Background

The Eastside Restoration Project covers approximately 13,500 acres on the east side of the Forest next to lava flows in lands administered by the Lassen National Forest. The project has many components including aspen release and meadow restoration, plantation thinning, improving health and resilience to natural forest stands, and improving the visual aesthetic surrounding power line corridors (Appendix A).

The last large fire recorded for the area was in 1918. Stands are dense and meadows and aspen groves have been encroached by lodgepole pine and white fir. The area is defined as matrix, outside of critical habitat, by the Land Use Management Plan (Forest Plan). The Forest Plan delineates this area for timber products with an overlay of riparian reserves.

There are 30-50 year old pine plantations throughout the project area separated by acres of natural forest with scattered legacy trees that survived the 1918 fire and aspen meadows. The area has several vernal lakebeds and wells. Dug-out ponds were put in to provide water to big game, but have disrupted the natural flow of water between the natural lakes and wells. There are two power corridors crossing the project area, each with a 200-foot easement and service roads making the easement 275 feet. The easements are currently referred to as the “Wall of Trees” due to the straight-line appearance.

Observations

The first stop on my visit was to see the stands around Caribou Well. These stands have large old aspen and young aspen clones within the meadows mixed with mature lodgepole pine and a white fir understory (Figure 1) with a few scattered ponderosa pines. The conifers have been encroaching on the meadow and aspen stands for quite some time and have developed a range of issues including mountain pine beetle in the mature lodgepole pine. Rounded root wads and delaminated decay pattern in the dead and down white fir surrounded by dead white fir saplings (Figure 2) made me suspect Heterobasidion root disease in white fir, but I was unable to confirm by the presence of

NORTHERN CALIFORNIA SHARED SERVICE AREA
3644 AVTECH PARKWAY, REDDING, CA 96002
(530) 226-2437

Cynthia Snyder
clsnyder@fs.fed.us

Figure 1. Mature and young clones of aspen with lodgepole pine and white fir encroachment.

Figure 2. Symptoms of Heterobasidion root disease in white fir including delaminated decay and rounded root wads on down white fir with dead saplings.

conks, however, *Phaeolus schweinitzii* conk was found in an area with scattered dead lodgepole pine and white fir (Figure 3). The *P. schweinitzii* fungus causes red-brown butt rot in both pines and true firs (and other species) though hardwoods are seldom affected. Although it is reported as a trunk rot, it almost always is confined to the root system and lower 8 to 10 feet of the bole. Infected trees are predisposed to windthrow and breakage.

Figure 3. *Phaeolus schweinitzii* conk in lodgepole pine and white fir.

The ponderosa pine plantations were planted in the 1960's – 1980's. The last big fire in 1918 left the site a brush field as seen in 1944 aerial photographs of the area. These brush fields were windrowed and planted to ponderosa pine on what looked to be about a 10 foot spacing. Some of the plantations were thinned in the 1990's. The current stand density indices range from 155 with diameters averaging 16 inches to 315 with diameters averaging 10 inches. Although the western pine beetle risk is very high, the greatest issue at this point in time is Ips in the tops of scattered trees (Figure 5). These plantations are at very high risk of establishing a western pine beetle population capable of moving into the large legacy pines in the natural stands. Thinning to a basal area of 80-100 would reduce the risk of western pine beetle becoming established and killing large pockets of pines and possibly moving out into the large legacy pines in the surrounding natural forest stands.

Figure 4. Dense ponderosa pine plantation, SDI 155-300 with average diameters 10-16 inches, with shade-tolerant white fir and incense cedar understory.

Figure 5. Ips attack and top-kill in ponderosa pine plantation.

The final stop was at a mixed conifer natural stand that was treated 20-25 years ago at which time all white fir was removed (Figure 6). This stand shows what the natural forest in the area could look like if treated similarly. The basal area is about 100 with large diameter mature ponderosa pine, Douglas-fir, and incense cedar with white fir coming into the understory. The only treatment I recommend for stands like this would be to reintroduce fire into the landscape to control the white fir and to make openings for early seral habitat and increased age diversity over time.

Figure 6. Natural forest stand that was treated 20-25 years ago - all white fir removed.

Discussion

A white paper distributed by forest Health Protection earlier this month described the health of California's forests and watersheds as at a critical point due to increasing drought frequency and severity combined with overstocking and excessive fuel loading. The need to create more resilient conditions is critical. Failure to reduce forest susceptibility to insects and diseases can lead to large-scale tree mortality events increasing fuels and tree hazards along roadsides, negatively impacting critical wildlife habitat and recreation, as well as increasing the risk of stand-replacing wildfire.

Drier pine sites, such as the ones at the eastern edge of the Forest, are more susceptible to high levels of bark beetle caused mortality during drought. Thinning in the overstocked plantations to a level that would reduce the stand density index to 25-40% of maximum would reduce the susceptibility to western pine beetle and keep the plantations below the 60% of maximum needed to remain resilient for 20 years. With the current water year being outside of drought conditions, it would be the best time to get thinning treatments

done before drought returns. Drought conditions reduce trees ability to produce resin that is the primary defense against bark beetles.

Root diseases caused by fungal pathogens that kill or decay roots often lead to tree mortality. Once established, many root diseases may become long-term problems for the host species. Heterobasidion root disease is suspected in the white fir encroaching with the lodgepole pine in the aspen meadows. Stumps greater than 14 inches in diameter are most likely to be infected and create new root disease pockets. Treating freshly cut stumps with a registered borate compound can prevent new infection centers. Removal of lodgepole pine and white fir encroaching into the aspen meadows should reduce and possibly remove *P. schweinitzii* infection.

The natural stands would benefit from thinning where overstocked, retaining a diverse species composition. The stand we ended at is a great example of how these stands could look if treated. The stand had all mature white fir removed 20-25 years ago and retained all Douglas-fir, ponderosa pine, sugar pine, and incense cedar. The basal area was 100-120 with white fir coming back into the understory. Returning fire to the landscape through control burns would control the white fir understory and brush. To increase diversity across the landscape, patches of early seral habitat could be created within these natural stands through group selections.

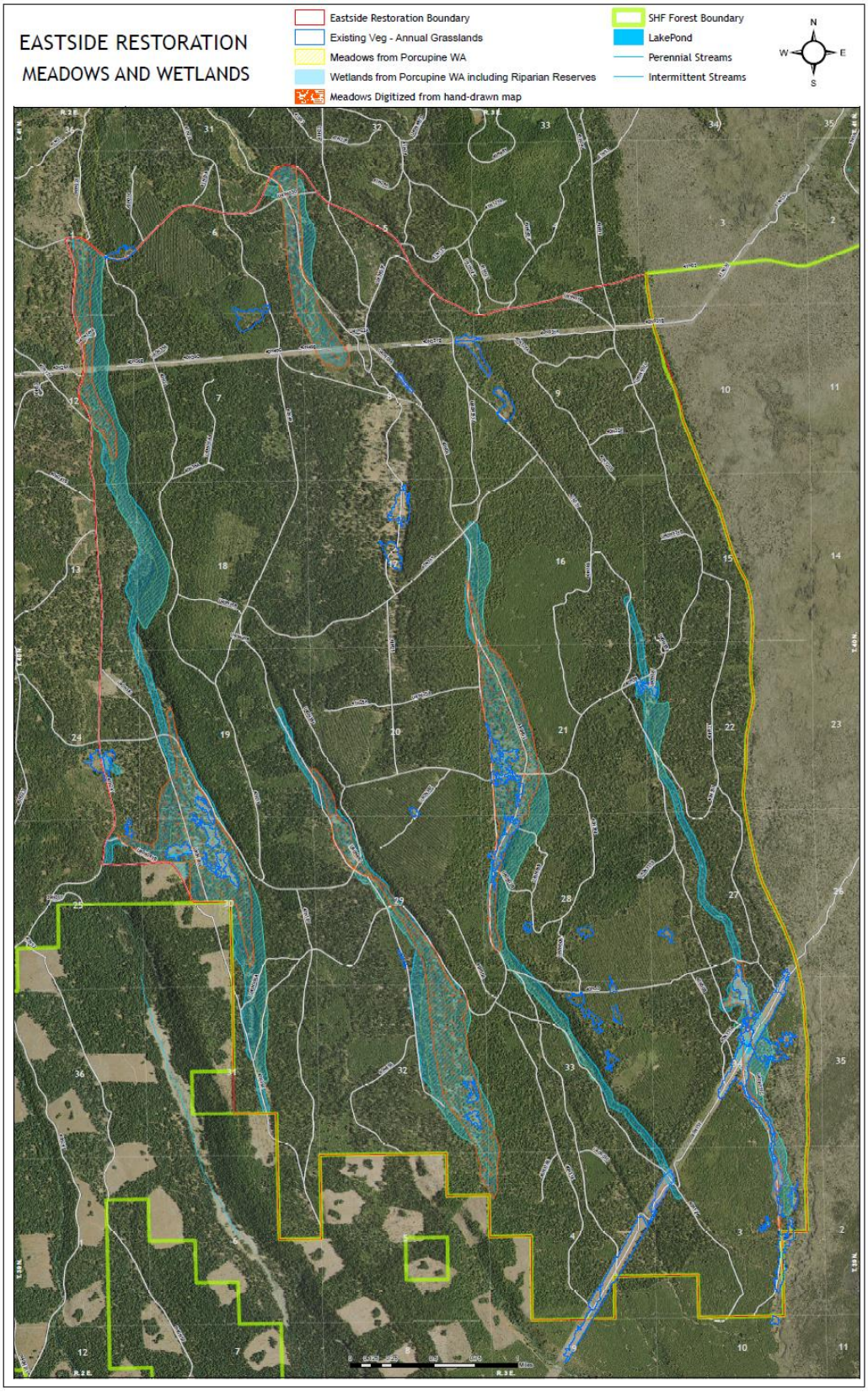
Overall, the project area has some minor insect and disease issues that will be addressed through the planned aspen and meadow restoration. My recommendations to apply a registered borate compound on all freshly cut stumps over 14 inches in diameter would reduce the risk of creating new Heterobasidion root disease infection centers. Thinning the pine plantations to 25-40% of maximum stand density index would reduce the risk of bark beetle within the plantations and into the natural stands where legacy trees remain. Thinning where needed in the natural stands to increase species and age diversity would also decrease bark beetle risk and enhance the general resilience of the forest through the next drought.

If you have any questions regarding this report and/or need additional information, please contact Cynthia Snyder at 530-226-2437.

/s/ Cynthia Snyder

CC: Craig Sewell, Terri Simon-Jackson, Carolyn Napper, Chris Losi, Sheri Smith, Phil Cannon, Sherry Hazlehurst, Chris Fischer

Appendix A.


EASTSIDE RESTORATION
MEADOWS AND WETLANDS
Eastside Restoration Boundary
Existing Veg - Annual Grasslands
Meadows from Porcupine WA
Wetlands from Porcupine WA including Riparian Reserves
Meadows Digitized from hand-drawn map
SHF Forest Boundary
LakePond
Perennial Streams
Intermittent Streams
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